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blind by railway corporations. In other countries, the railway corporations have provided the necessary safeguards without the compulsion of legislation. In our country, the National Government has not been slow to appreciate the importance of this subject. By order of the Surgeon General of the navy, all persons connected with the navy have been tested for the color sense, and a record of all defects of this kind are filed with the Department. I presume that Congress will be asked to order the discharge from the navy of every person found color-blind. Hon. John Sherman has issued orders to all inspectors of licenses to have all pilots of steam vessels tested for color-blindness, and to withhold licenses from all persons affected with this defect. In the army all recruits are examined, and all found color-blind are marked unfit for the signal corps.

The agitation of this subject has already commenced in several of our State Legislatures, thanks to the untiring efforts of Dr. Joy Jeffries, of Boston. Massachusetts is deliberating before and discussing the policy of legislation. Connecticut has already passed a stringent and ample law controlling railway corporations in regard to employing the color-blind. Its character may be inferred from the second section of the law, which reads as follows: "Any railroad company or trustee operating any railroad in this State, employing, after the first day of October next, in any of the capacities specified in the second section of this act, any person who does not possess a certificate of freedom from color-blindness, and possession of normal visual power, duly issued in accordance with the provisions of this act, or knowingly employing in any such capacities any person whose certificate has been revoked by the examiners, shall, for each and every offense, be punished by a fine of not less than two hundred dollars nor more than one thousand dollars." Approved March 25, 1880.

Mr. President, I trust the time is not far distant when the agitation of this law will invade this temple of justice and wisdom. From its sacred precincts numberless edicts have gone forth in defense of humanity, which have given the commonwealth of Kansas the proudest position in the sisterhood of the Union. I am happy in believing that there is no subject that concerns the safety of human life, too lowly or insignificant to be introduced here; nor is there any prejudice or vice, or evil or crime, so insolent or contumelious as to intimidate the Goddess of Liberty and Humanity, who has her home within this temple.

THE RAINFALL IN ITS RELATIONS TO KANSAS FARMING.

By H. R. Hilton.

Political economists tell us that the foundation of the wealth and prosperity of a nation lies in the productions of its soil.

Science tells us that the successful production of crops is dependent principally on the climate, or the proper distribution of heat and moisture.

The climate of a country bears the same relation to its agriculture that the products of the soil do to its general prosperity; and successful farming must rely as fully on a properly-adjusted supply of moisture and heat, as the prosperous State or Nation does on its agricultural production. The farmer may bring drainage, fertilizers and a thorough system of cultivation to his aid, but his success is, after all, proportioned to the kind of season with which he has been favored. That system of farming approaches nearest perfection, that takes into consideration the varieties of climate under which the system is to be carried on, as well as the varieties of soil to be tilled, and engages in the cultivation only of such products as are adapted to both soil and climate.

The resources of Kansas are almost exclusively agricultural, and in Kansas agriculture is specially dependent on the climate. Every business interest in the State is affected, favorably or adversely, as our crop seasons are good or bad; and a thorough and intelligent knowledge of our climate is one that concerns the welfare of our State and every resident in it.

That the system of cultivation and variety of crops in this State should, in so many instances, be so much at variance with the climate and the soil, must be attributed not so much to ignorance on the part of our farmers, as to the fact that both soil and climate were new to them, and different from that to which they had been accustomed in other States further to the East. They had no precedent to follow, and naturally adopted whatever rotation of crops or whatever system of cultivation they had been accustomed to at their former homes. It required, and is still requiring, years of experiment to determine what crops must be abandoned and what adopted, and under what plan of cultivation the best results can be secured. The first ten years of the settlement of any portion of our State may be termed the experimental stage of its history, and many failurs have to be recorded and drawbacks overcome before experiments determine what system of cultivation and variety of crops are best adapted to the wants of that particular section of the State.

In passing over the State from east to west, we find that a gradual change in the soil takes place—that of eastern Kansas being as distinct from the soil of the western counties, as is found in the climate of these respective localities; while in central Kansas we find the soil to be a compromise between the two extremes.

The soil of eastern Kansas is a black loam, resting on a clay formation; that of central Kansas a dark, sandy loam, resting on a porous marl clay formation; while that of western Kansas has a still more sandy surface soil and more porous subsoil. This is the general subdivision, subject to occasional variations. As a rule, the surface soil grows deeper and the subsoil more porous, as we pass from the east towards the west.

The rainfall is graduated from the east to west across the State, with as much regularity as the soil, the precipitation being about one-third greater in eastern Kansas than in western, and about one-fifth greater than in central Kansas. But here a law of compensation enters in to modify this difference, the moisture-absorbing and retaining qualities of the soil being much greater in central and western Kansas than that of the eastern portion of the State. As an illustration of this point, let us take a tract of cultivated land with a black-loam surface soil one foot deep, resting on a clayey subsoil. On this tract of land two inches of rain falls. One-half is sufficient to thoroughly saturate the surface soil down to the clay; the balance is rejected for want of capacity in the soil to store it, and in consequence this surplus flows off into the stream.

Let us now take another tract of sandy loam, two feet deep, resting on a porous subsoil, on which two inches of rain falls. This soil, having double the storing capacity of the tract first named, receives all the rain, and instead of wasting half, stores the full amount for future use.

The natural deduction from this would be, that the soil two feet deep, storing a double quantity of moisture, will be more than twice as long in parting with it; not only because it holds more of it, but because it is stored further from the surface and from the influences of the sun's heat, drying winds, and consequent evaporation.

The experience of Eastern farmers who have carefully noted the effects of drainage on their soil is, that a tract of land on which the surface soil has been deepened by drainage will produce crops on one-half the rainfall that was necessary prior to drainage; or in other words, by doubling the capacity of the reservoir for storing and retaining the moisture in the soil, a much less quantity of rainfall is now necessary to produce like results.

It would seem to follow from this, that the amount of rainfall sufficient to raise crops in one locality may be either too much or too little for some other localities having more or less absorptive soil.

For instance, if thirty-five inches be the amount of annual rainfall necessary to farm successfully in the State of Illinois, eastern Kansas, with its better-drained soil, will furnish as much moisture to plant-life on twenty-five inches of rainfall per annum, and western Kansas as much on a fall of twenty inches; and if Illinois and eastern and western Kansas had a like amount of land under cultivation, I think the standard of sufficient rainfall for each would bear about the same relation to each other as the figures I have already quoted, based upon the theory already advanced, that for the purposes of comparison, the absorption and retentive qualities of the soil, and the amount of rain utilized, rather than the amount that falls, shall be taken into consideration. Had time permitted, I should have been pleased to show, by a series of experiments with glass tubes filled with soil, the absorptive qualities of the different varieties to which I have referred, and hope at some future time to have an opportunity to do so. Perhaps some of our State institutions will take this matter up, and give it a more thorough test than it would be possible for me to do.

By keeping in mind the peculiarities of our soil to which I have referred, we can, I think, better understand why cultivation of the soil has so materially changed the climate of our State; and to this subject I wish now to call your attention.

The source of our water supply is mainly in the Gulf of Mexico. This supply is transported hither in the form of aqueous vapor, by means of the great aerial currents that flow northward from the gulf with so little variation during the summer months, and here precipitated in the form of rain. Part of this is received and stored in the soil for the use of plant life, part is returned to the atmosphere by evaporation, and part is drained off into the streams, and carried back to the ocean, where it is again evaporated and returned to us by the aerial currents. Thus our water supply is making a continual circuit—flowing to the ocean as water, and returning therefrom as vapor.

As the wind currents are the mediums of conveyance of moisture from the ocean to the land, a knowledge of the laws that govern their direction is an important factor in the solution of our probable rain supply.

The summer winds of Kansas are mainly southernly, those from the southeast and south predominating over those from the southwest.

During the winter season, the winds blow from all points of the compass, the prevailing direction being from the west, northwest and north. The summer winds from the south are generally humid. The northerly and westerly winds are generally dry.

The steadiness of the wind breezes from the south during the summer season may be attributed to two causes. One, the trade winds from the northeast, flowing southwest toward the equator, south of the thirtieth parallel, strike against the mountain chain of Central America, and are deflected to the northwest, along the eastern slope of the mountains, and making a grand curve, return over Kansas as a south or southwest wind. The other cause is the monsoon influence of the heat-radiating plains, which attracts the moist and cooler breezes from the ocean. These come to us as south or southeast winds. All of these southerly winds carry more or less moisture.

The same influence that brings to the Mississippi Valley States, parallel with Kansas, their supply of moisture, brings it to Kansas.

Our rainfall is less, simply because we offer less favorable conditions for precipitation. Supply these conditions, and our rainfall is measurably comparable with those States. Where the rainfall of Kansas is deficient, it is more a lack of the necessary conditions of soil, vegetation and local evaporation than a lack of humidity in the aerial currents passing over. The latter are rarely wanting in moisture, during the summer months. The conditions necessary to wring this moisture from the atmosphere are conspicuously absent over a large area of Kansas, and these are: deeply-plowed and well-cultivated fields, growing crops, larger area of trees, ponds of water, and ranker vegetation of all kinds more generally distributed. With these supplied, the question of the sufficiency of our rainfall will not be such a vexatious one as it is at present.

A comparison of the climate of the eastern half of Kansas, before and since it has been brought under man's civilizing influence, affords strong proof of the climatal changes brought about by settlement.

What Kansas is to-day west of the ninety-ninth meridian of longitude, all of Kansas lying west of Topeka was twenty-five years ago. Then the buffalo grass covered all the prairies, except along the streams, as far east as Topeka. Vegetation was scant, as the freighters across the plains in those days can testify. Immense herds of buffalo kept the surface tramped hard, and together with the sun-baking process that it underwent, rendered the soil impervious to rain, which it shed like a shingled roof. Prairie fires aided this petrifying process by burning off the sparse vegetation almost annually. Hot winds were a consequence of this exposed heat-radiating surface. The principal rain supply of the summer months was through the medium of thunder storms, of great severity. Precipitation took place at a high elevation, and was very rapid. Gentle showers and general rains, such as we are now frequently favored with, were then very rare. During the first ten years farming was attended with many difficulties and discouragements, on account of the seasons, and few believed that the frontier of settlement could ever be extended west of Topeka, except, perhaps, a short distance along the valleys. But in spite of these many discouragements of the climate, the pioneer settlers ventured first just outside the Missouri valley, then gradually westward, step by step, mile by mile, and each year saw a little further advance made upon the Great American Desert, until now we find the land possessed for 300 miles west of the Missouri river. And what has been the consequence of this possession? The plow has been actively at work, and the water-shedding roof on over 8,000,000 acres of land has been torn up; the soil has been tilled, and a storehouse provided for the rainfall that was formerly wasted. Forest and fruit trees, millions in number, have been planted, proving a valuable climate-ameliorating accessory to the cultivated soil and ranker plant growth.

From these combined causes came an increased humidity of the atmosphere, and a more general diffusion of moisture from the new water supply held in reserve. Increased humidity was rapidly followed by plants and grasses that find their best development in a humid climate. The tall blue-stem grass, that could not withstand the dry, arid climate of the plains, now follows in the wake of the settlements, and takes possession of the soil, on which the short, wiry buffalo grass had so long flourished, because it alone was capable of sustaining life on a limited supply of moisture.

The tillage of the soil and growing of trees made the first breach in the arid climate; moisture was sufficiently increased to favor the growth of the blue-stem grasses. When these took possession, I believe their influence was greater than all other causes combined, because by covering the major portion of the country with a heavy coating, that greatly reduced radiation, they removed one of the most stubborn agencies that the pioneer had to contend with. It also, by penetrating the now shaded soil with its strong roots, caused the former surface-hardened roof to leak, and enabled the soil to drink in and retain moisture that had previously been denied it.

Cultivation, tree planting, mulching, change of grasses, prevention of wide-spreading and destructive fires—these are the great agencies that have wrought such a wonderful change in the climate of the eastern half of Kansas. Even if no more rain falls on the earth now than in the early days of the State's history, it is better distributed throughout the season. We have more gentle showers, more general rains, and while we may have as many thunder storms, they are not marked with the severity of the years that preceded the civilization of our soil and climate.

Our streams, that were then constantly fluctuating from dry river-beds to overflowed banks, now have a more even flow, not feeling the effects of heavy showers at once, and overflowing only in cases of extremely heavy rainfall. The moisture held in reserve by the heavy grasses and cultivated soil keeps the streams constantly supplied, and many of these that formerly contained water only a portion of the year, now flow permanently.

We have only to look around us, and note the grasses, the streams, the soil, products, and the changes in plant growth, to find that nature has furnished us the best possible evidence of the climatal changes that have taken place in our State, and all the statistical data we may compile are valuable only so far as they are corroborated by these evidences which nature presents to us.

Moist air is said to be three-fifths lighter than dry air at the same temperature. Cold dry air possesses greater density and weight than hot dry air.

In the pre-civilized days of Kansas, when vegetation was very sparse, the sun's rays poured down upon the unprotected surface, which, owing to its hardness, absorbed the sun's heat to a very limited extent, and instead threw it off into the surrounding atmosphere, raising its temperature proportionately. The effect of this increased temperature was to set the air in motion. Cooler air rushed in to fill the vacuum, to be again heated and kept in motion.

There being comparatively no moisture in the ground to evaporate and moisten the surrounding air, it remained dry, and being of greater density than the moist currents above, a local stratum of hot air was formed between this moist current and the earth's surface. Being by reason of its greater weight unable to force its way through the lighter air above, its motion became lateral instead of upward; and on account of this lateral motion, the air, in passing over a large area of heated surface, became intensely heated. With the increased temperature came increased velocity, and hence the hot winds so prevalent on the plains many yars ago, and now occasionally experienced on and beyond our frontier of settlements.

After sundown the earth, owing to its limited capacity for absorbing heat, cooled rapidly, and the surrounding atmosphere changed from a hot, dry stratum, to a cold one of greater density, but of diminished thickness.

My theory is, that this stratum of hot, dry air, next the earth's surface, insulates the ground from the moist aerial currents passing over. It is a bad conductor of electricity. Electric communications between the earth and the clouds are difficult to establish, because the earth, by reason of its dryness and lack of vegetation, offers no attraction. When an electric discharge from the clouds to the earth takes place, the resistance of the dry air makes its severity and destructiveness many times greater than would be the case were a good conductor provided; for the better the conductor, the more quietly and harmlessly are these discharges effected.

The atmosphere of the plains is highly electrical, but owing to the insulation referred to, discharges are more frequently made between cloud and cloud, than between the clouds and the earth. When a breach has been made in this insulation, and an electric discharge takes place between clouds and earth, it is generally violent, and followed by rapid condensation and heavy rainfall.

Atmospheric electricity is now believed by many to be a force generated by the liberation of latent heat, when the vapor in the air is precipitated into clouds, or clouds into rain; it is therefore a result, and not a cause, of such precipitation. I believe it, however, to be an important factor in the precipitation of the water held in the clouds, but in what exact way it acts beneficially, we can only surmise.

When the clouds are charged with positive, and the earth with negative electricity, discharges from one to the other invariably follow. The rapidity of the discharge through the air creates a vacuum which sets the air in motion. Its equilibrium has been disturbed, and before readjustment takes place, a portion of the moisture is condensed and parted with in the form of rain.

If I am correct in my theory of the stratification of the atmosphere, it is obvious that, in order to change the climate, we must remove the insulating stratum of dry air, and bring the earth and the moist currents of air more nearly in contact with each other.

We know that eastern Kansas had at one time a climate in many respects similar to that of western Kansas of to-day. We know that the climate of one-half of Kansas has been changed by the civilizing influences of man. Our soil has been surrounded by a new atmosphere. Material for evaporation is now supplied from the reservoirs provided for the reception of the rainfall. The heat imparted to the atmosphere by radiation now carries with it moisture evaporated from the soil; and this warm, humid air, on account of its expansiveness and consequent lightness, rises upwards into higher latitudes, displacing the colder and more dense atmosphere, which sinks to the surface to fill the vacuum created by the uprising current, which is in turn warmed, moistened and carried upward. These ascending and descending currents have a tendency to disturb the relative temperature and consequent equilibrium of the atmosphere. Such conditions favor condensation of the vapor in the air, and the more humid the ascending current the better the electric conductor.

The tendency of thunder storms to follow streams and timber belts may be attributed, I think, not so much to the elevation of the tree itself above the ground, as to the greater amount of humid air that is ascending from such timber belts, affording the most favorable conducting medium. Anything that will aid in increasing evaporation will aid in establishing better communications between the clouds and the earth, and insure a greater frequency of local showers during the summer season.

The mirage, so peculiar to our Western climate, seems to me to furnish excellent testimony regarding the existence of a local stratum of air, and its partial destruction afterward by settlement. The mirage I understand to be due to a ray of light refracted through three or more strata of air of different densities, lifting up into view objects lying below the horizon of our vision. In order, then, to produce the mirage, there must be stratification.

When Reno county was first occupied by settlers, about ten years ago, the buffalo grass covered the prairies, and the mirage could be seen on almost any summer-day. Now it is a rare occurrence, because the settlement of the country, and the consequent change of vegetation, have reduced radiation, increased evaporation, and partially prevented stratification.

To increase our rainfall, then, we must do these two things: Reduce radiation and increase evaporation.

Many have an impression that by increasing the local evaporation we really provide the moisture from which we receive the rain. This I think a fallacy. We will undoubtedly get a small percentage of the amount evaporated back again in the form of rain, but we must depend mainly on the acqueous vapors brought to us from the Gulf of Mexico for our main supply of rainfall. The local evaporation is valuable to us, because it furnishes the conditions necessary to wring from the atmosphere the moisture we want.

The water supply of timbered countries has been reduced by removing the timber, and again increased by replanting. Yet the annual supply of moisture in the atmosphere was not materially different in the years of a short water supply from those of abundance. The removal of the timber removed one of the essential conditions of rain precipitation, viz.: local evaporation. The replanting of the timber was simply the restoration of the desired condition.

Many of our residents feel discouraged on account of the severity of the drouth on our western frontier during 1879 and part of 1880. Were such drouths of frequent occurrence, it would, indeed, be discouraging, but it must be remembered, that its like was never known in the history of the Plains, and we only find a parallel to it for a shorter period in the drouth of 1860, when the pioneer settlers in this vicinity suffered about all that our frontier settlers have done in the past year. Such an extreme period of drouth we have no reason to anticipate oftener than once in every twenty years, although we are liable to periodic drouths on a smaller scale, the same as any other portion of our country. We must not, therefore, judge of the future by the experience of the past two years; we must take the average of a succession of years.

Within the past few months I have heard the wish often expressed that the western half of the State might be cut off from Kansas, and attached to some other State or Territory, so that we might not be compelled to shoulder the responsibility for the recent failure of crops on our western frontier, and consequently suffer in reputation.

The remark is a foolish one, and the authors will acknowledge it before they are many years older.

The rainfall will, in my opinion, never be so great in western Kansas as in eastern Kansas, but its soil requires less. I do not believe that western Kansas will ever be a general farming country in the sense that eastern Kansas is, but I do believe its natural resources are just as great.

We do not condemn eastern Kansas as a farming or fruit country because bananas and oranges cannot be successfully raised in it; nor do we condemn Florida because the products of a cold climate are not successfully produced there.

Our Western farmers have been experimenting in the past few years, and the stimulating effect of the recent drouth has not been without fruit. New discoveries are being made each season of some new plant more especially adapted to the climate and soil. The rapid development of the Egyptian, or rice corn, in the past two years, is a notable instance of this. The success and value of this new crop, and its ability to stand even as severe a drouth as that of this spring, has been shown beyond a doubt.

The successful and profitable manufacture of sugar from amber cane has been fully demonstrated by Mr. Bennyworth, at Larned, Pawnee county, this season. Mr. Bennyworth has spent about $25,000 in the experiment, and while he failed to establish his works in time to use his cane and make a financial success, he has accomplished enough to prove that the climate and soil of western Kansas are specially adapted to the raising and ripening of cane. This cane can be successfully raised in the dryest season, and no crop is more certain anywhere. An acre converted into sugar and syrups is estimated to yield from $75 to $100, on a fair yield. There are 10,000,000 acres of land west of the ninety-ninth meridian in this State that will produce $50 worth of sugar per acre, and in the production of it will support a larger population than is possible with any other Kansas crop. Broom corn is a successful crop in western Kansas, and one that, like sugar cane, encourages home manufactures. With a more thorough system of cultivation than that now practiced, wheat will be successfully raised four seasons out of five.

The sheep and cattle interests of western Kansas will always be the most important ones, and the success of millet and rice corn, as feeding crops, in that portion of the State, will stimulate the production of a better grade of beef and mutton than has theretofore come from the west.

With a diversified systef of farming, with each farmer producing a little of each of wheat, sugar cane, broom corn, millet, rice corn, vegetables, etc., and as much stock as they can conveniently handle, instead of confining themselves to one crop, there will be fewer cases of failure to record; but farmers of Kansas, east and west, must remember one thing, that in order to get the most advantage out of their present rain supply, they must plow deep; they must get below the hard upper crust; they must thoroughly pulverize the soil so that it will act as a mulch, and then they will increase the moisture-storing capacity of their soil, and practically make a great increase in the rainfall, by utilizing it to its fullest extent.

A good illustration of the value of such a system of farming, I found recently on the farm of W. H. Gill, of Pawnee county, one of the best cultivated farms in Kansas. In June, 1879, Mr. Gill plowed an eighty-acre field of old ground over eight inches deep, afterwards thoroughly fining the soil by frequent harrowing, and by heavy rolling just before seeding to wheat. After the wheat was again rolled. Both showers did not exceed an inch of rainfall, and yet from that field nine bushels per acre were harvested this year. If such a record can be made under such circumstances, it will be easily seen on what a small rainfall a successful crop of wheat can be raised, when cultivated according to Mr. Gill's method. This instance also illustrates the peculiar properties of this soil for absorbing and holding moisture.

During the first week in October last, rain fell for three consecutive days, almost without cessation, all over western Kansas, and Mr. Gill informs me that not a drop of that three days' rainfall ran off the surface of his plowed land, but all was received into the soil.

The irrigating ditch at Garden City, Sequoyah county, illustrates the same principle. While there last week, I saw fields of corn that would be considered fair in this vicinity, that had only been flooded once this season.

No one questions the fertility of the soil of Kansas, and owing to its fine natural drainage, it is less affected by excessive rains or excessive drouths than the heavy soils of the Mississippi valley States. Our rainy season is our crop-growing season; our dry season is our stock-feeding season.

Taking our average of the past ten years, our record as an agricultural State is equal to that of any State in the Union. The great diversity of our soil and climate brings within our reach the production of a great diversity of crops; and if we carefully observe and study all its peculiarities, with a view of adapting all our products to it, there is no good reason why Kansas should not be among the leading agricultural States, if not the leading one, of the Union.

ON THE MAGNETIC DECLINATION IN KANSAS FOR OCTOBER, 1880.

By Prof. H. S. S. Smith, State University, Lawrence.

It is required by the law of this State that each county surveyor shall "compare the magnetic with the true meridian at least four times a year, viz., between the first and fifteenth of January, April, July, and October," and shall report "to the Secretary of State, and" to "the President of the University of the State of Kansas." Up to the present year, this law has been, so far as I know, a dead letter. In September last, the President of the University asked me to take charge of the matter, and the results obtained are as follows. It is to be regretted that the discussion is so partial, but the small number of counties heard from—only 36, in a total of 75 organized counties—renders a complete summation impossible. The total number of reports for January is 12; for April, 13; for July, 14; for October, 36.

The following are the figures, arranged in alphabetical order of counties. I give only those for October, as the small number of reports for January, April and July render any conclusions for those months next to worthless:

Town.	County.	Eastern Declination.
Garnett	Anderscn	10° 30′ E.
Great Bend	Barton	10 45 30″
Concordia	Cloud	10 16
Junction City	Davis	10 35
Lawrence	Douglas	9 30 15
Kinsley	Edwards	11 29 30
Ellsworth	Ellsworth	10 43
Ottawa	Franklin	9 37 30
Eureka	Greenwood	10 10 30
Fordham	Hodgeman	11 45 30
Burr Oak	Jewell	11 46
Oswego	Labette	9 44 30
Leavenworth	Leavenworth	9 46
Mound City	Linn	8 30
Peabody	Marion	9 8
Marysville	Marshall	11 45
Paola	Miami	9 35
Beloit	Mitchell	11 3
Council Grove	Morris	9° 20′
Seneca	Nemaha	10 27
Bazine	Ness	11 30
Norton	Norton	11 49
Lyndon	Osage	10 27
Osborne	Osborne	12 20
Minneapolis	Ottawa	11 22
Phillipsburg	Phillips	11 55
Louisville	Pottawatomie	10 57
Hutchinson	Reno	10 35
Survey	Rooks	11 50
Lacrosse	Rush	11
Russell	Russell	11 4
Salina	Saline	11 46 20
St. John	Stafford	11 55
Washington	Washington	10 15
Fredonia	Wilson	10 30
Yates Center	Woodson	10 30